

METHOD FOR SOFTWARE PIPELINING OF IRREGULAR CONDITIONAL CONTROL LOOPS

5 Abstract of the Disclosure

 A method for software pipelining of irregular conditional control loops including pre-
processing the loops so they can be safely software pipelined. The pre-processing step ensures
that each original instruction in the loop body can be over-executed as many times as necessary.
During the pre-processing stage, each instruction in the loop body is processing in turn (N4). If
10 the instruction can be safely speculatively executed, it is left alone (N6). If it could be safely
speculatively executed except that it modifies registers that are live out of the loop, then the
instruction can be pre-processed using predication or register copying (N7, N8, N9). Otherwise,
predication must be applied (N10). Predication is the process of guarding an instruction. When
the guard condition is true, the instruction executes as though it were unguarded. When the
15 guard condition is false, the instruction is nullified.